Regency® COMMUNICATIONS INC.

SERVICE MANUAL

VHF FM TRANSCEIVER

MODEL MCH 40

1227 S. PATRICK DR.
SATELLITE BEACH FL

0300-4091-800

PRINTED IN USA
5-79

PRELIMINARY SERVICE INFORMATION FOR MCH 40

1. Radio Schematic
2. Test Procedure
3. PA Board Parts Overlay Showing Circuitry
4. Control Panel Parts Overlay Showing Circuitry
5. Main Board Parts Overlay Showing Circuitry
6. Main Board Parts Placement Diagram
7. Parts List

APPLICATION	
NEXT ASSY	USED ON
	MCH 40

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	R-002	1-17-78	M.G. C.H.
B	AA-364	[illegible]	[illegible]

REV B | SH 1 | TP14-116 | DWG. NO.

FINAL TEST PROCEDURE MICRO-COM H 40 SERIES

A. Transmitter Alignment

I. Test Set-Up

A. Equipment

1. MICRO-COM H 40 Transceiver
2. HP 410 DC VTVM
3. DC Power Supply with Ammeter 13.6 VDC 10 Amps DC
4. VOM Simpson 360 (Digital)
5. AC VTVM
6. Audio Oscillator
7. Mic matching network
8. 150 MHz Thruline Wattmeter, 30 db Power Pad and 100 W Element
9. Spectrum Analyzer
10. Deviation Meter *
11. Frequency Counter *
12. Small Blade Tuning Tool and Hex Tuning Tool
13. Tune-Up Crystal
14. Band Reject Filter
15. PTT Switch

* Can be replaced with Cushman or similar equipment

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE FRACT. ± DEC .XX± .XXX± ANG. ±	APPROVALS	DATE
	DRAWN MF/C. MC	
	CHECKED	
	DFTG. SUPV.	
MATERIAL ———	ENGR. CJH	1-8 78
FINISH ———		
DO NOT SCALE DRWG.		

Regency® COMMUNICATIONS INC.
SATELLITE BEACH, FLORIDA 32937

TEST PROCEDURE MICROCOM H 40

SIZE	PART NUMBER	REV.
A	TP14-116	B

SCALE ——— SHEET 1 OF 12

B. Test Interconnection Diagram

Transmitter Tests

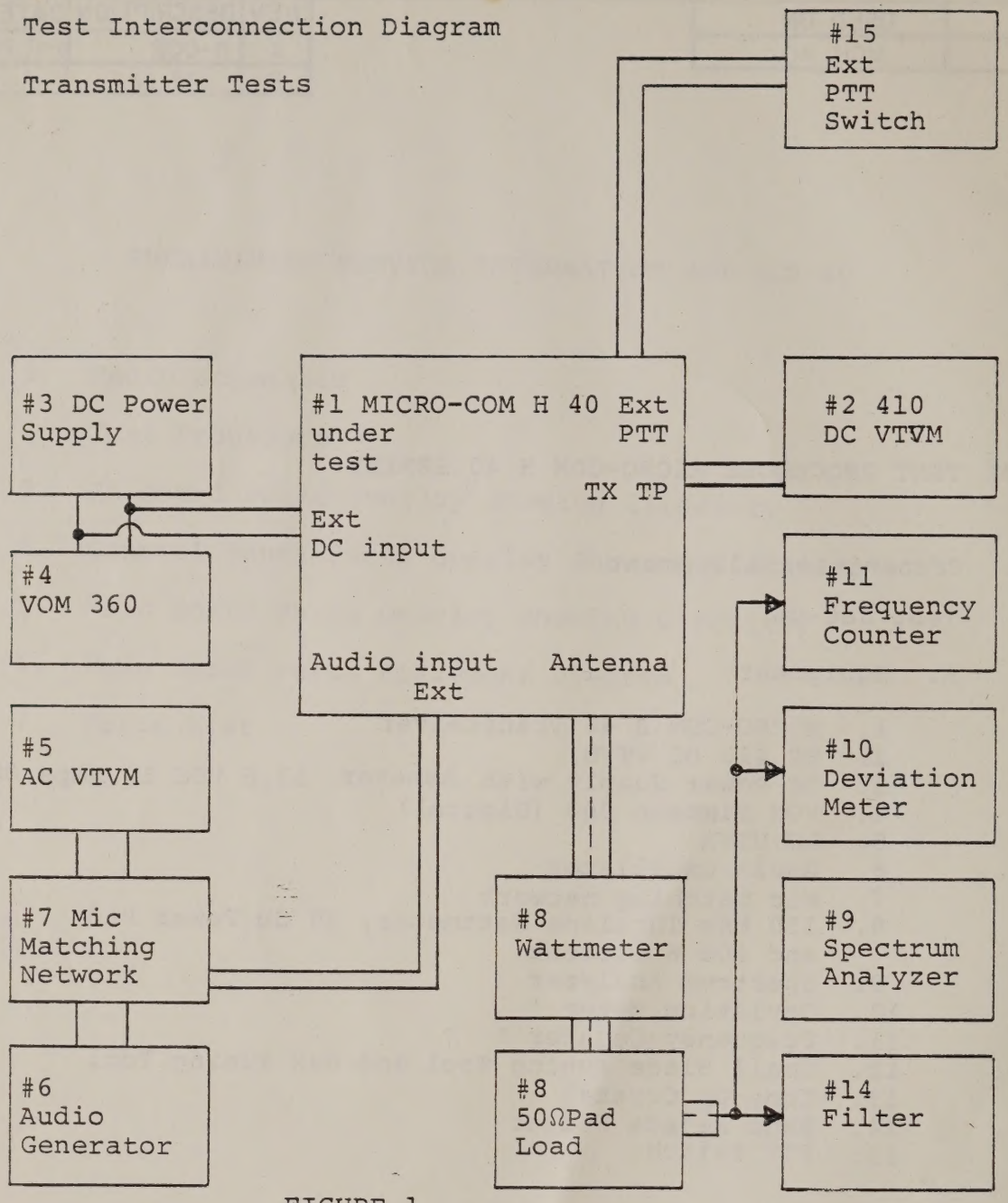
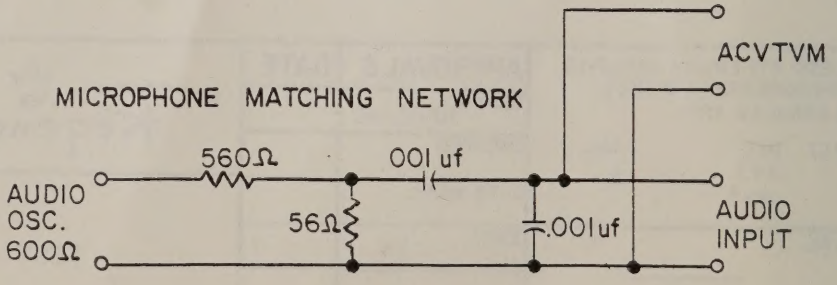


FIGURE 1



DRAWN MF / C. MC	DATE	SIZE A	PART NUMBER TP14-116	REV. B
APPROVED CJH	DATE 5/1			
DO NOT SCALE DWG.		SCALE ———		SHEET 2

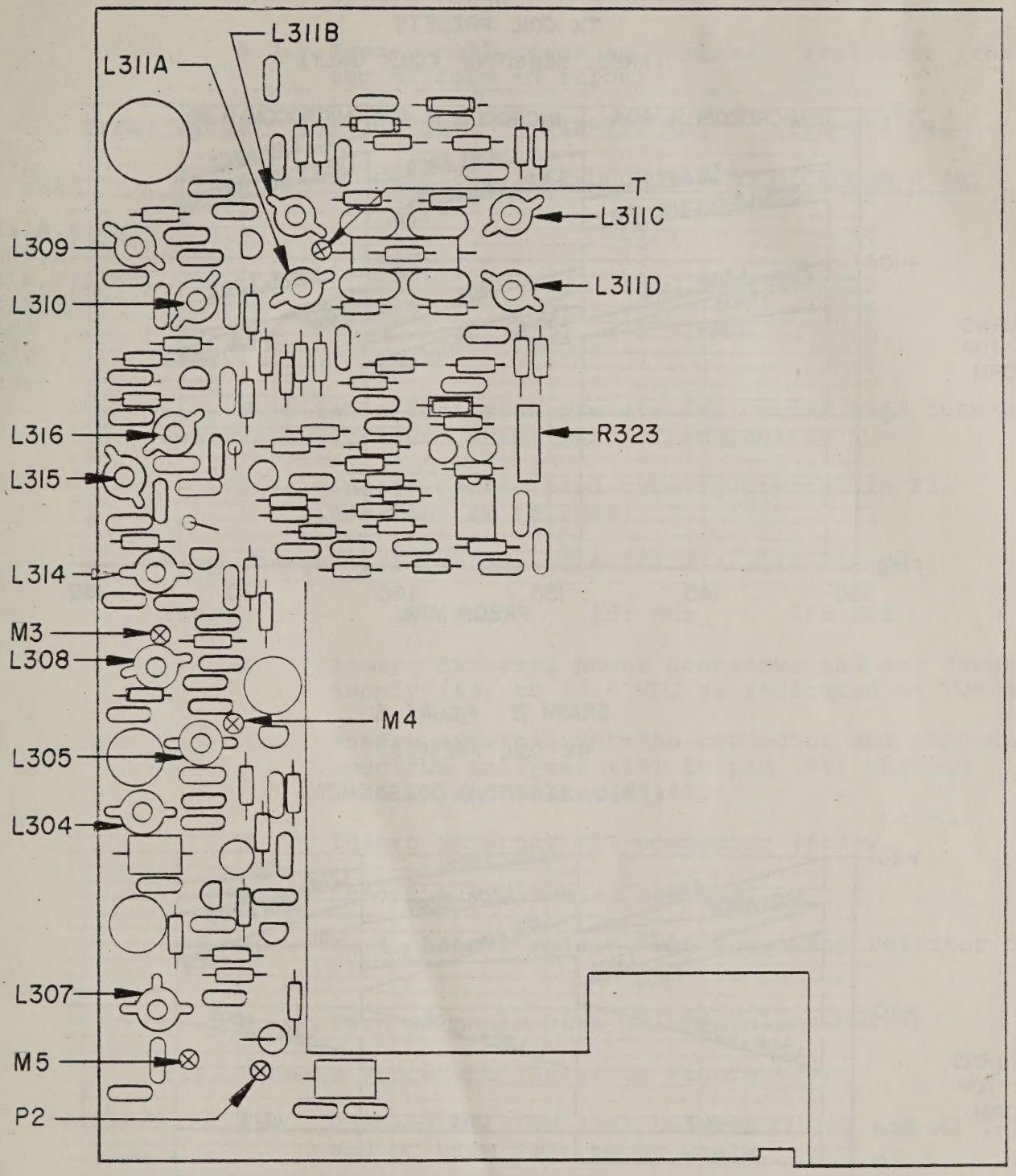


FIGURE 2

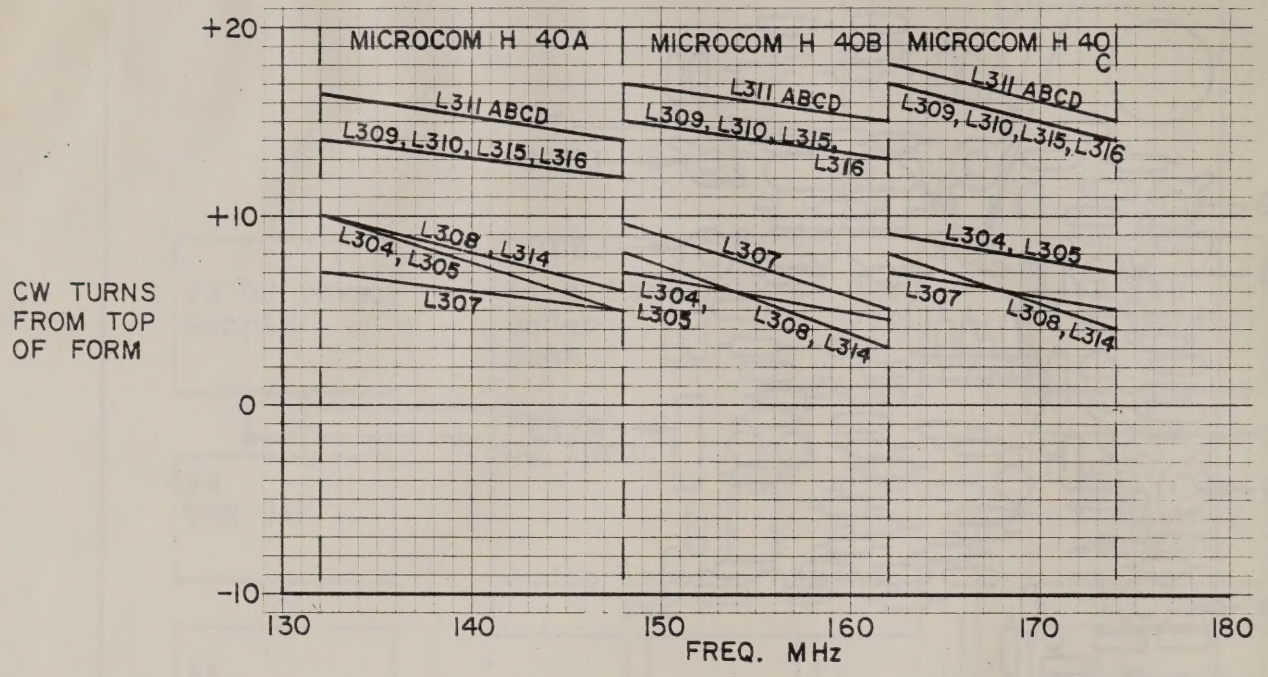
TRANSMITTER BOARD TUNING POINTS

DRAWN MF / C. MC	DATE	SIZE A	PART NUMBER TP14-116	REV. B	
APPROVED	DATE				
DO NOT SCALE DWG.		SCALE ———		SHEET 3	

GRAPH I FIGURE 5

TX COIL PRESETS

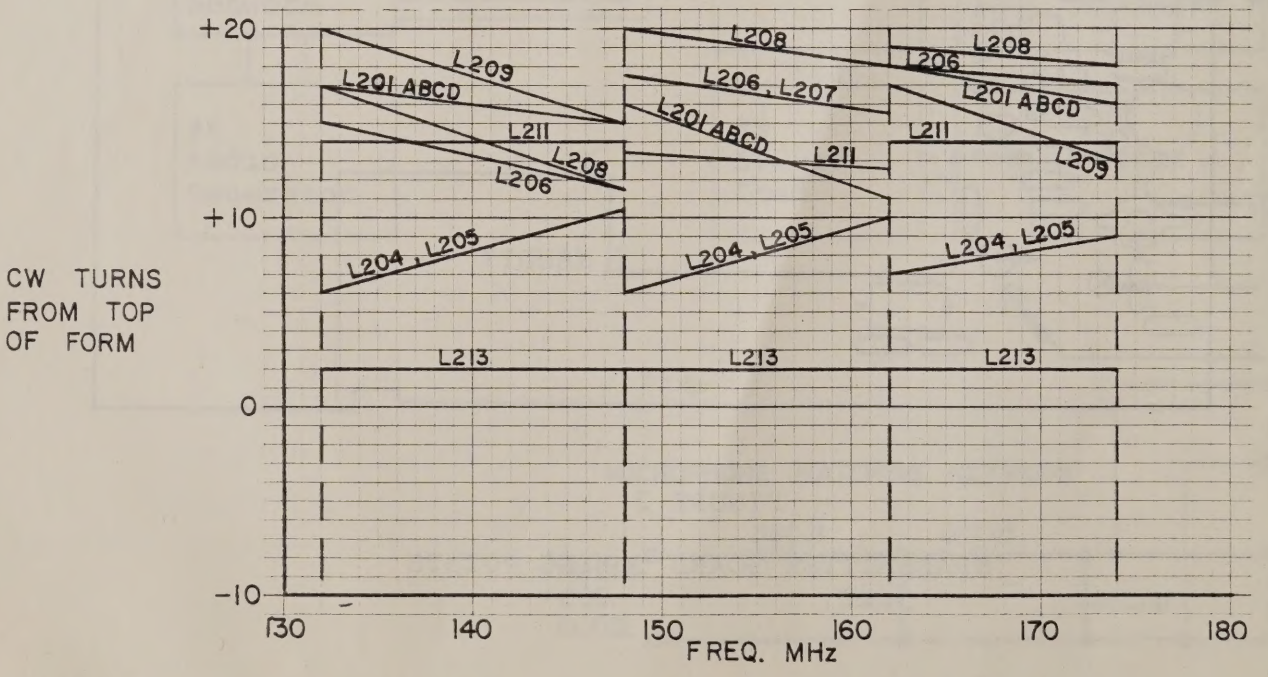
(FREQ. SENSITIVE COILS ONLY)



GRAPH II FIGURE 6

RX COIL PRESETS

(FREQ. SENSITIVE COILS ONLY)



DRAWN MF / C. MC	DATE	SIZE A	PART NUMBER TP14-116	REV. B	
APPROVED	DATE				
DO NOT SCALE DWG.		SCALE ———		SHEET 4	

II. A.1. Preset potentiometer R323 so that it is at mid range.

A.2. Preset coil cores as follows: (measured from top of form in turns)

Freq. Range		132-148 MHz	148-162 MHz	162-174 MHz
Coil	Color	MICROCOM H 40A	MICROCOM H 40B	MICROCOM H 40C
L311A,B,C,D	Grn	16.5	16.5	18
L309,L310	Org	14.5	13	16
L316,L315	Org	15	14	15
L314,L308	Red	9.5	5	6
L304	Wht	8	6	8
L307	Org	6.5	7	6
L305	Red	9	8	7

This Table indicates presets for center band tune-up. See Graph I, Figure 5 for other frequencies.

B. Insert center band tune-up crystal in F1 position as follows:

Freq. Range	132-148 MHz	148-162 MHz	162-174 MHz
Freq.	140 MHz	155 MHz	168 MHz

C. Insert External power connector and set Power Supply (#3) to 13.6 VDC as indicated on VOM(#4).

D. Insert external antenna connector and connect Spectrum Analyzer (#9) to pad (#8) through Band Reject Filter (#14).

E. Insert external PTT connector (#16).

F. Insert mic matching network. (#7)

G. On 4 channel models, set frequency selector to F1.

H. Turn on radio with ON/OFF Volume Switch.

III. Tune-Up Procedure (Refer to Figure #2).

A.1. Connect DC VTVM (#2) between P2 (+) and M3 (-) and DC VTVM (#2) to 5V scale.

2. Key transmitter with the external PTT. Listen for relays to click then proceed to next step.

B. Key transmitter with the external PTT and tune L315, L316, L310 and L309 in that order for maximum reading on DC VTVM #2. Voltage should be 3.0 VDC ±.5V (M3).

C. Connect DC VTVM (#2) between P2 (+) and M4 (-), then set DC VTVM (#2) to 5.0V scale.

D. Tune L314 and L308 for maximum reading on DC VTVM (#2). Voltage should be 1.5 ±0.5 VDC (M4).

E. Connect DC VTVM (#2) between P2 (+) and M5 (-), then set DC VTVM (#2) to 2.5V scale.

F. Tune L304 and L305 for maximum reading on DC VTVM (#2). Voltage should be 0.5 ±0.2 VDC (M5).

G. Tune L307, C111, and C117 on the PA Deck for maximum power output as measured on wattmeter #8. Power should exceed 40W. For marine coast stations tune C11 clockwise to reduce output power to 50 watts if the station exceeds 50W.

H. Repeat Steps A1, B, C, D, E, F, and G.

I. Set the Spectrum Analyzer (#9) and Band Reject Filter (#14) for maximum carrier indication on the 0 db reference line. Attenuate the carrier with the Band Reject Filter (#14) a minimum of 30 db. Check for 2nd harmonic level on the Spectrum Analyzer. The second harmonic should be greater than 59 db down.

J. Check input current to the transceiver on the DC Power Supply (#3). This level should not exceed 12 amps.

K. Connect the Counter (#11) to the output of the Pad (#8) and set the warp control for F1 (L311A) for the nominal crystal frequency ±.0001 MHz in Section II B.

L. Connect Audio Signal Generator to the mike connector input using the appropriate matching network (#7), key transmitter and set the Audio Signal Generator (#6) for 1 KHz tone and 150 mv AC as indicated on the AC VTVM (#5).

M. Connect the deviation meter (#10) to the pad (#8) and adjust the deviation, adjust R323 for ±5 KHz deviation as measured on the Deviation Meter.

N. Check modulation sensitivity by reducing the Audio Generator Output until the deviation is ±3.0 KHz. Measure the Audio Generator Input Voltage on the AC VTVM. This level should be less than 20 mv AC.

O. On 4 channel models, reconnect the counter (#11) to the pad (#8) and check F2, F3, and F4 warp controls with the crystal. All positions shall be capable of being warped on frequency ±100 Hz. Repeat step L. Monitor with deviation meter (#10); deviation should be 4.5 KHz ±0.5 KHz.

DRAWN MF / C. MC	DATE	SIZE A	PART NUMBER TP14-116	REV. B
APPROVED CJH	DATE			
DO NOT SCALE DWG.		SCALE ———		SHEET 6

P. Connect DC VTVM(#2) between T(+) and gnd(-). Then set DC VTVM to 50V scale.

Q. DC VTVM(#2) should read 13.6VDC. Cool thermostat ST301 below 5°C or 41°F. DC VTVM(#2) should read 0 VDC and crystal heater resistors R207 and R340 should begin to heat.

R. DC VTVM should read 13.6VDC when ST301 warms to 10°C or 50°F.

IV. Table of Performance Limits

PARAMETER	MIN	TYP	MAX	UNITS
M3	2.5	3.0	3.5	VDC
M4	1.0	1.5	2.0	VDC
M5	0.3	0.5	0.7	VDC
TX Power Output	40.0	50.0	60.0	Watts
Mic mod sens	---	15.0	20.0	mv
Deviation	---	---	±5	KHz
TX freq. error	---	±20.0	±250.0	Hz
TX freq. error W/ ±5KHz Dev.	---	-300.0	-500.0	Hz

B. Receiver Alignment

I. Test Set-up

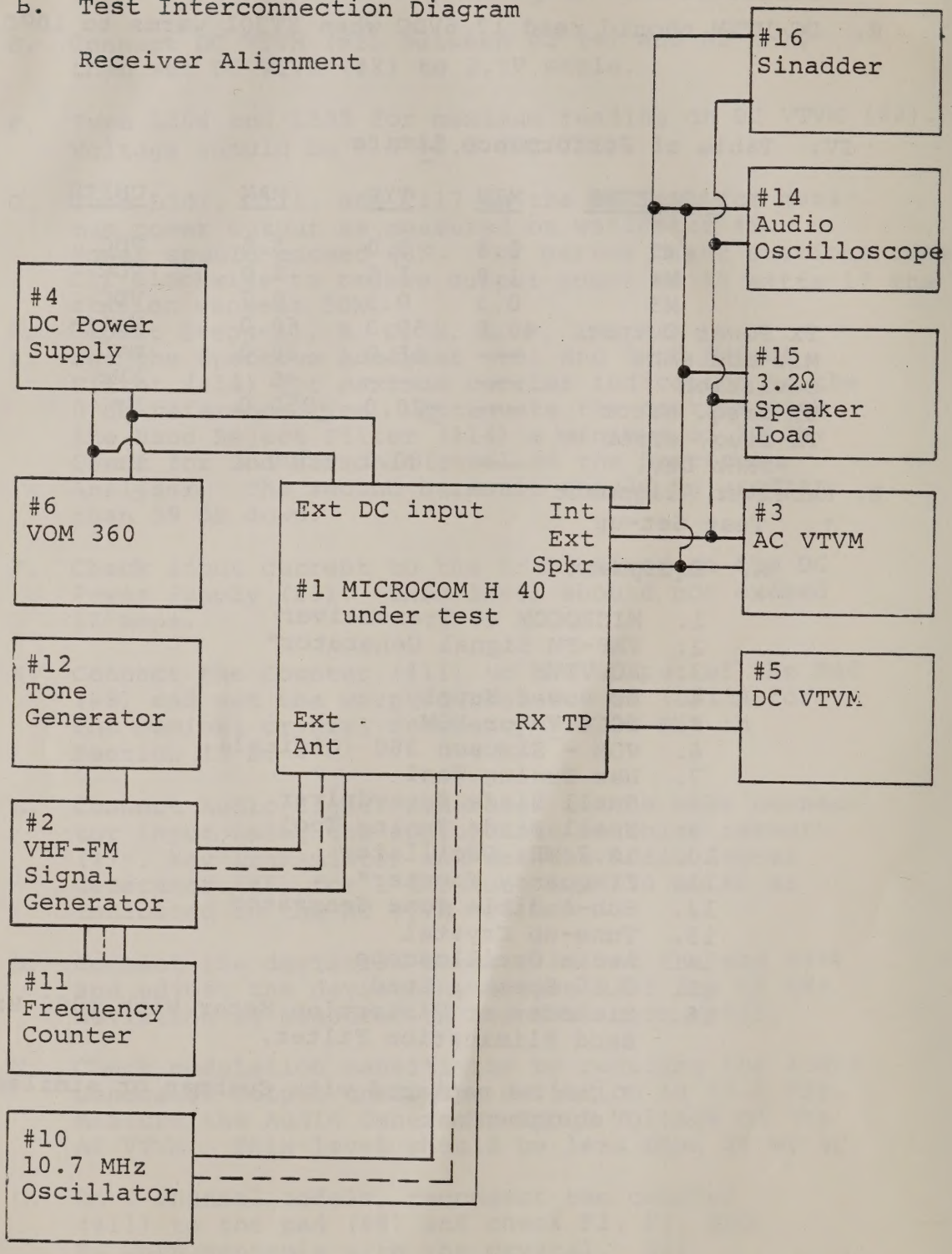
A. Equipment

1. MICROCOM 40 Transceiver
2. VHF-FM Signal Generator*
3. AC VTVM
4. DC Power Supply
5. DC VTVM or VOM
6. VOM - Simpson 360 (Digital)
7. Hex Tuning Tool
8. Small Blade Screwdriver
9. Small Blade Tuning Tool
10. 10.7 MHz Oscillator
11. Frequency Counter*
12. Sub-Audible Tone Generator
13. Tune-up Crystal
14. Audio Oscilloscope
15. 3.2Ω Speaker Load
16. Sinadder or Distortion Meter with 1000 Hz Band Elimination Filter.

* Can be replaced with Cushman or similar equipment.

b. Test Interconnection Diagram

Receiver Alignment



DRAWN MF / C. MC	DATE	SIZE A	PART NUMBER TP14-116	REV. B
APPROVED CJH	DATE 8-3-78			
DO NOT SCALE DWG.		SCALE ____		SHEET 8

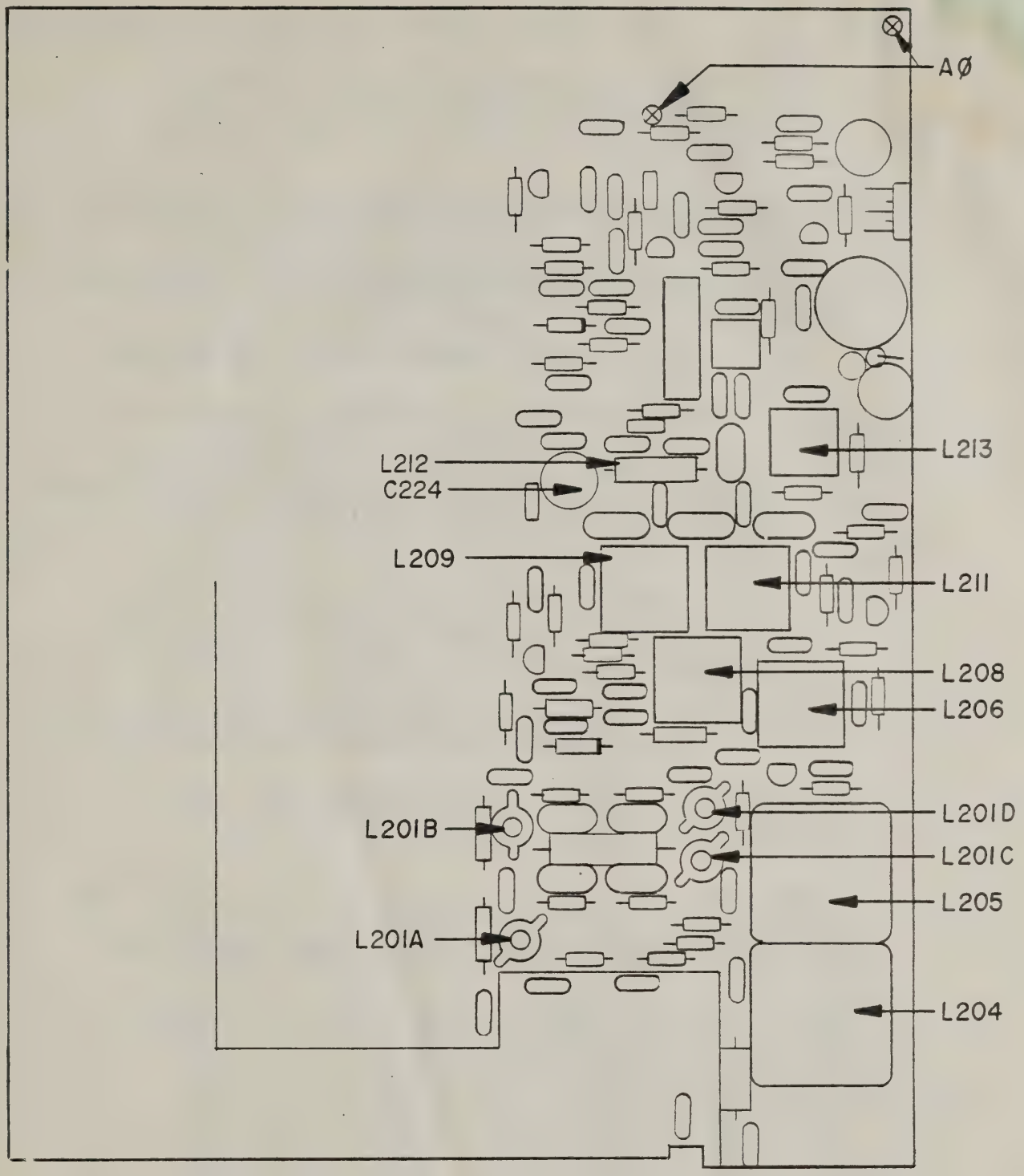


FIGURE 4

RECEIVER TUNING POINTS

DRAWN MF / C. MC	DATE	SIZE A	PART NUMBER TP14-116	REV. B
APPROVED	DATE			
DO NOT SCALE DWG.		SCALE		SHEET 9

II. Preset Conditions

A. Set DC Input Voltage at 13.8 VDC as measured on #6 DC VOM.

B. Insert center band tune-up crystal in F1 position (V201A).

Band	132-148 MHz	148-162 MHz	162-174 MHz
Crystal Freq.	140 MHz	155 MHz	168 MHz

C. Set VHF-FM Signal Generator #2 to center band tune-up crystal frequency measured on the Frequency Counter #9 and output attenuator to -130 dbm (zero output).

D. 1. Set squelch control (R402) fully CW.
2. On tone units, set tone monitor switch to monitor position, or unground microphone hangup button.

E. Set ON-OFF Volume Control (R403 to Off) fully CCW. In 4 channel models, set Channel Selector to F1.

F. Preset coil cores per following table.

Turns Measure From Top of Coil Form or Top of Can

Coil	Color	132-148 MHz	148-162 MHz	162-174 MHz
L204	Alu	8 Above	5 Above	8 Above
L205	Alu	8 Above	5 Above	8 Above
L206	Yel	12T	16T	16T
L208	Org	12T	20T	18T
L209	Grn	17T	16T	15T
L211	Wht	14T	14T	13T
L213	Blk	2T	2T	2T
L201 (ABCD)	Red	17T	17T	18T

* Set C224 so Silver Plate points toward L212.

This table indicates center band tune-up crystal presets. See Graph II, Figure 6 for other frequencies.

DRAWN	MF / C. MC	DATE	SIZE	PART NUMBER	REV.
APPROVED		DATE	A	TP14-116	B
DO NOT SCALE DWG.			SCALE ———		SHEET 10

III. Tune-Up Procedure (Refer To Figure #1)

A. Connect AC VTVM (#3) across the speaker load and adjust the ON-OFF Volume Control for a readable output level on the audio output AC VTVM #3 on the 1V scale.

B. Connect DC VTVM (#5) between Aϕ and ground; and adjust L213 (detector coil) (Blk) for a 3.4 VDC on DC VTVM(#5) by feeding a strong 10.7 MHz signal into the area of L212 and C224* as indicated on the receiver tuning chart. Aϕ voltage should measure 3.4 VDC as indicated on the DC VTVM meter #5. Remove 10.7 MHz signal.

C. Increase the output of signal generator #2 set for 1 KHz tone and 3 KHz deviation. Observe meter #16 and increase signal generator output for 6 db sinad.

D. Adjust L204, L205, L206, L208, L209, L211, and C224* for best 12 db sinad. Constantly reduce signal generator #2 output for 12 db sinad on meter #16.

E. Remove modulation from signal generator #2 and set it to a level to produce a "beat note" with a 10.7 MHz signal coupled to L212. Warp L201A until the audio "beat note" frequency is zero. This warps the receiver on frequency.

F. Adjust signal generator #2 for 1 KHz tone modulation and 3 KHz deviation. Measure 12 db sinad on meter #16. The signal generator should read 0.25μv ±0.1μv.

G. Increase signal generator #2 to 1000μv and turn volume control R403 to full level. AC VTVM #3 should exceed 3.6V AC.

H. Remove modulation from signal generator #2 and set it to -130 dbm signal level. Set AC VTVM #3 to 1V scale and use volume control to set voltage on AC VTVM #3 to 1.0V AC. Increase signal generator #2 until AC VTVM #3 reads 0.1V AC. This 20 db quieting level should be less than 0.5μv and typically 0.4μv.

I. Reduce the output of signal generator #2 to -130 dbm and set squelch control R402 to threshold just quieting receiver noise. Increase signal generator level #2 until noise appears. This is threshold squelch level and should be less than 0.3μv.

DRAWN MF / C. MC		DATE	SIZE A	PART NUMBER TP14-116	REV. B
APPROVED CJH		DATE 7 8 71			
DO NOT SCALE DWG.		SCALE ———			SHEET 11

J. Turn the squelch control R402 fully counter-clockwise and increase the signal generator level until squelch opens again. This is tight squelch and should be less than 1.0μv.

K. In 4 channel models repeat steps E and F for F2, F3, and F4 tuning L201B, L201C, and L201D correspondingly.

*Models built after Jan. 1979 will have C224 deleted.

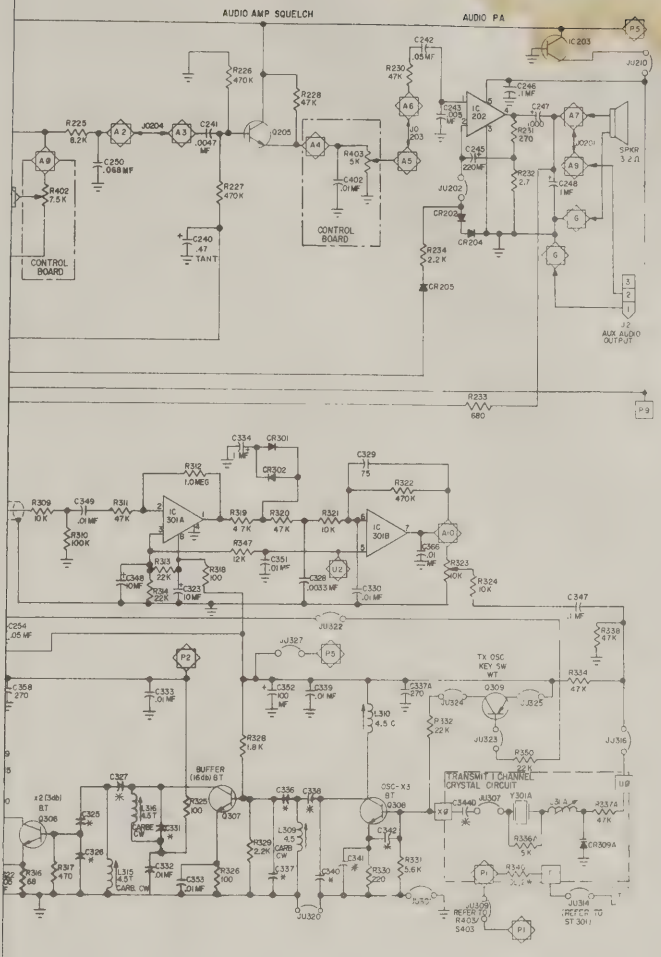
IV. Table of Performance Limits

PARAMETER	MIN	TYP	MAX	UNITS
Aϕ	3.2	3.4	3.6	VDC
12 db Sinad		0.25	0.35	μv
20 dbq	---	0.35	0.5	μv
Threshold Squelch	---	0.20	0.30	μv
Tight Squelch	0.4	0.5	1.0	μv
Audio Output 1 KHz Tone 3 KHz Dev.	3.6	4.0	----	VAC
Noise Output	2.5	3.0	----	VAC

C. SPECIFICATIONS AND OTHER DATA PERTINENT TO MICROCOM H40

I. Specifications

a. Drawing #304-100
b. Drawing #304-106
c. Drawing #304-107
d. Drawing #304-108



REF DESIGNATIONS	
LAST USED	NOT USED
R104, R235	C102, C107, C110,
R360	C114, C123, C233, C238
C124, C256	R103
C347	L106
Q102, Q205,	C301, 302, 304, 305, 306
Q309	C307, 308, C313, C317,
CR102, CR205	C320, 341, 342, 343, 344, 345
CR311	R201, 223
L107, L214,	R301, 302, 303, 304
L321	R311, 312, 313, 335
PCL104, 202	R348, R351, 352
T101	
Y202, Y301	CR303, 304, 305,
R203, 301	CR306, 307, 308
XP203	L301, L306
JU101, 211	JU317, JU319, JU326
JU327	

NOTES

1. ALL CAPACITOR VALUES NOT SPECIFIED OTHERWISE ARE PICO-FARAD
   ALL RESISTOR VALUES NOT SPECIFIED OTHERWISE ARE OHMS, 1/4 WATT
2. PARTS MARKED WITH * ARE VARIABLE WITH MODEL (SEE PARTS VARIABLE CHART)
3. PART NUMBERS INDICATE LOCATION
   - 0-99 CHASSIS MOUNTED PARTS
   - 100-199 P.A DECK BOARD
   - 200-299 RECEIVER SECTION MAIN BOARD
   - 300-399 TRANSMITTER SECTION MAIN BOARD
   - 400-499 CONTROL PANEL BOARD
4. ⬡ DENOTES PIN LOCATED ON P.C. BOARD
   - □ DENOTES CIRCUIT TIE POINT
   - ○JU○ DENOTES SOLDERED IN JUMPERS
   - ○JU○ DENOTES HARDWIRED JUMPERS
   - ⬬JU⬬ DENOTES PLUGGED IN JUMPERS
   - ——— INDICATES BOARD BOUNDARIES
   - — — — INDICATES OPTION VARIATIONS

	L210	C201	C208	C341	C342	C344D	C346	C338	C318	C356	C327
T	47	10	1	150	150	56	82	8.2	4.7	2.7	8.2
	.27	8.2	68	100	100	33	68	6.8	3.9	2.2	6.8
	27	5.6	68	100	100	30	47	6.8	3.9	1.5	6.8

REV	CHANGE	DATE
G	ENAA 548	4-78
F	ENAA 422	5-78
E	Chyson ENAA 377	7-78
D	Chyson ENAA 377	7-78
C	Chyson	7-78

DRAWN	ENAA 338	10-77	
CHECKED			
ENGR APPR			
MFG APPR			

MCH 40

Regency ELECTRONICS INC. INDIANAPOLIS, INDIANA

SCALE: NONE | DESIGN: CM&C 1-13-78 | CHECKED

TITLE: SCHEMATIC

DWG NO. 704-023

SHEET 1 OF 1

J. Turn the squelch control R402 fully counter-clockwise and increase the signal generator level until squelch opens again. This is tight squelch and should be less than 1.0μv.

K. In 4 channel models repeat steps E and F for F2, F3, and F4 tuning L201B, L201C, and L201D correspondingly.

*Models built after Jan. 1979 will have C224 deleted.

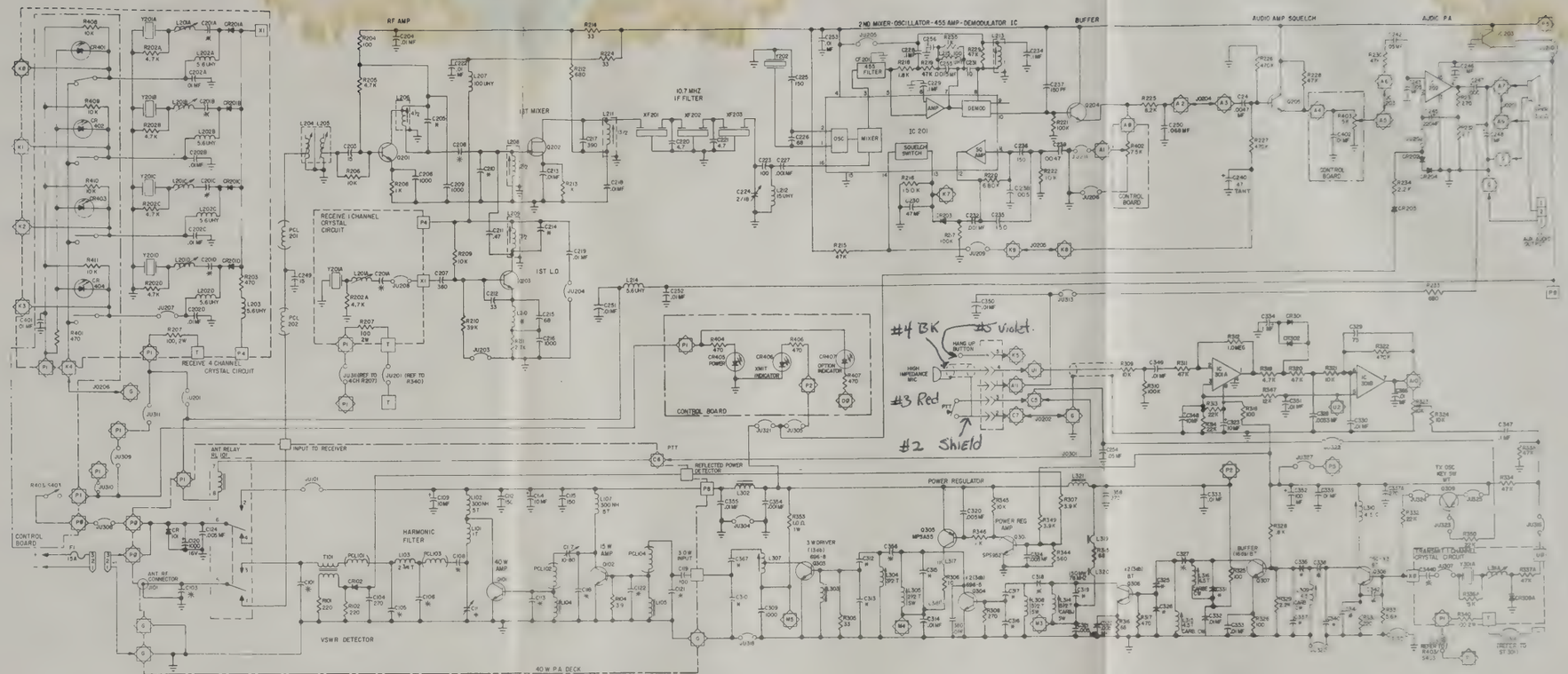
IV. Table of Performance Limits

PARAMETER	MIN	TYP	MAX	UNITS
Aϕ	3.2	3.4	3.6	VDC
12 db Sinad		0.25	0.35	μv
20 dbq	---	0.35	0.5	μv
Threshold Squelch	---	0.20	0.30	μv
Tight Squelch	0.4	0.5	1.0	μv
Audio Output 1 KHz Tone 3 KHz Dev.	3.6	4.0	----	VAC
Noise Output	2.5	3.0	----	VAC

C. SPECIFICATIONS AND OTHER DATA PERTINENT TO MICROCOM H40

I. Specifications

a. Drawing #304-100
b. Drawing #304-106
c. Drawing #304-107
d. Drawing #304-108



REF DESIGNATIONS

LAST USED — NOT USED

R94, R235 — C102, C107, C110, C116, C123, C233, C278
C134, C256, R103 — C467
Q102, Q206 — C314, 340, 341, 301, 306
Q301 — C102, 106, C193, C367
CR201, CR205 — C134, 342, 343, 349, 365
CR311 — E201, 223
L107, L214 — E311, 312, 313, 335
L331 — E315, 392, 393, 335
PCL104, 202 — E312, E321, 372
T101 — E313, 314, 315
Y202, Y301 — E303, 309, 305
E303, 301 — E304, 307, 308
XF203 — L301, 306
JU101, 211 — JU313, 319, 320
JU327

NOTES

1. ALL CAPACITOR VALUES NOT SPECIFIED OTHERWISE ARE PICO-FARAD
   ALL RESISTOR VALUES NOT SPECIFIED OTHERWISE ARE OHMS, ¼ WATT
2. PARTS MARKED WITH * ARE VARIABLE WITH MODEL (SEE PARTS VARIABLE CHART)
3. PART NUMBERS INDICATE LOCATION
   0-99 CHASSIS MOUNTED PARTS
   100-199 P.A. DECK BOARD
   200-299 RECEIVER SECTION MAIN BOARD
   300-399 TRANSMITTER SECTION MAIN BOARD
   400-499 CONTROL PANEL BOARD
4. ⬡ DENOTES PIN LOCATED ON P.C. BOARD
   □ DENOTES CIRCUIT TIE POINT
   ○—○ DENOTES SOLDERED IN JUMPERS
   ⌒ DENOTES HARDWIRED JUMPERS
   ⌒ DENOTES PLUGGED IN JUMPERS
   ——— INDICATES BOARD BOUNDARIES
   - - - INDICATES OPTION VARIATIONS

PA PARTS VARIABLE

FREQ RANGE	C101	C103	C105	C106	C108	C111	C113	C118	C121	C122
132-148 MHZ	18	18	36	22	12	8-80	300	100	120	56
148-162 MHZ	15	15	33	18	10	6-60	250	68	75	47
162-174 MHZ	15	15	33	18	10	6-60	200	56	75	47

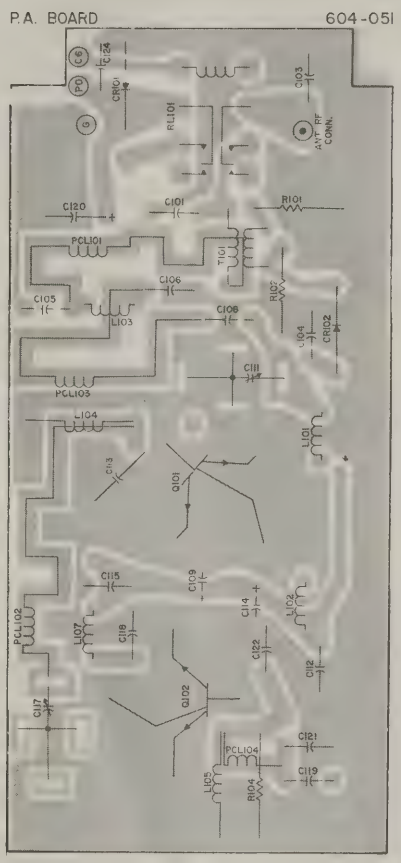
TX AND RX PARTS VARIABLE

MODEL	FREQ RANGE	C310	C312	C313	C315	C316	C317	C319	C325	C326	C331	C336	C337	C340	C367	C205	C214	C210	L204	L205	L210	C201	C208	C341	C342	C3440	C346	C358	C318	C356	C327
MICRO COM H41A H44A	132-148 MHZ	27	15	56	6.8	120	47	39	150	300	120	150	300	100	12	8.2	12	15	13½ T	13½	47	10	1	150	150	56	82	8.2	4.7	27	8.2
MICRO COM H41B H44B	148-162 MHZ	24	12	47	5.6	100	39	33	100	270	82	100	270	82	10	5.6	10	8.2	13 T	13	27	8.2	68	100	100	33	68	6.8	3.9	2.2	6.8
MICRO COM H41C H44C	162-174 MHZ	22	10	39	4.7	82	36	30	82	220	82	82	180	68	10	3.9	8.2	6.8	12½ T	12½	27	5.6	68	100	100	30	47	6.8	3.9	1.5	6.8

MCH 40

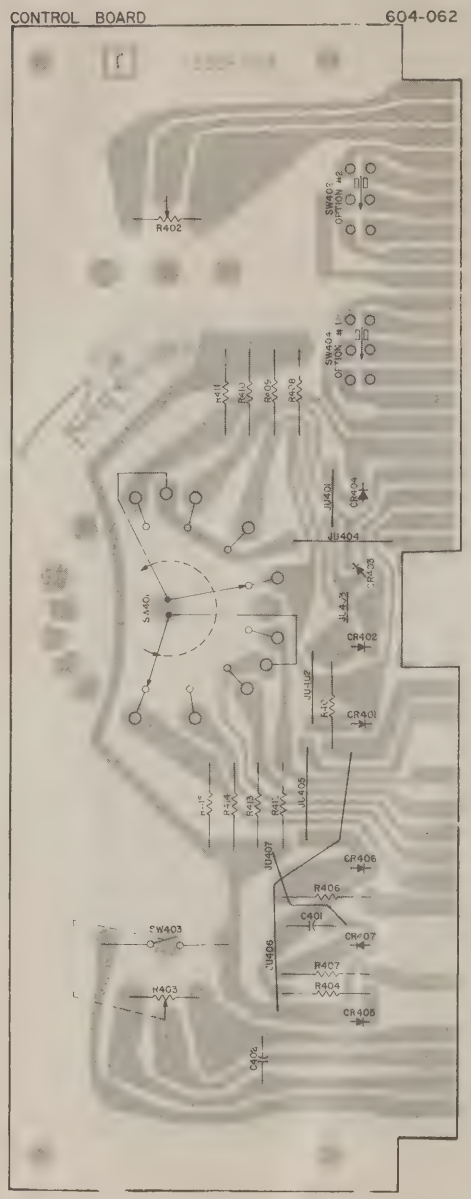
SCHEMATIC

704-023



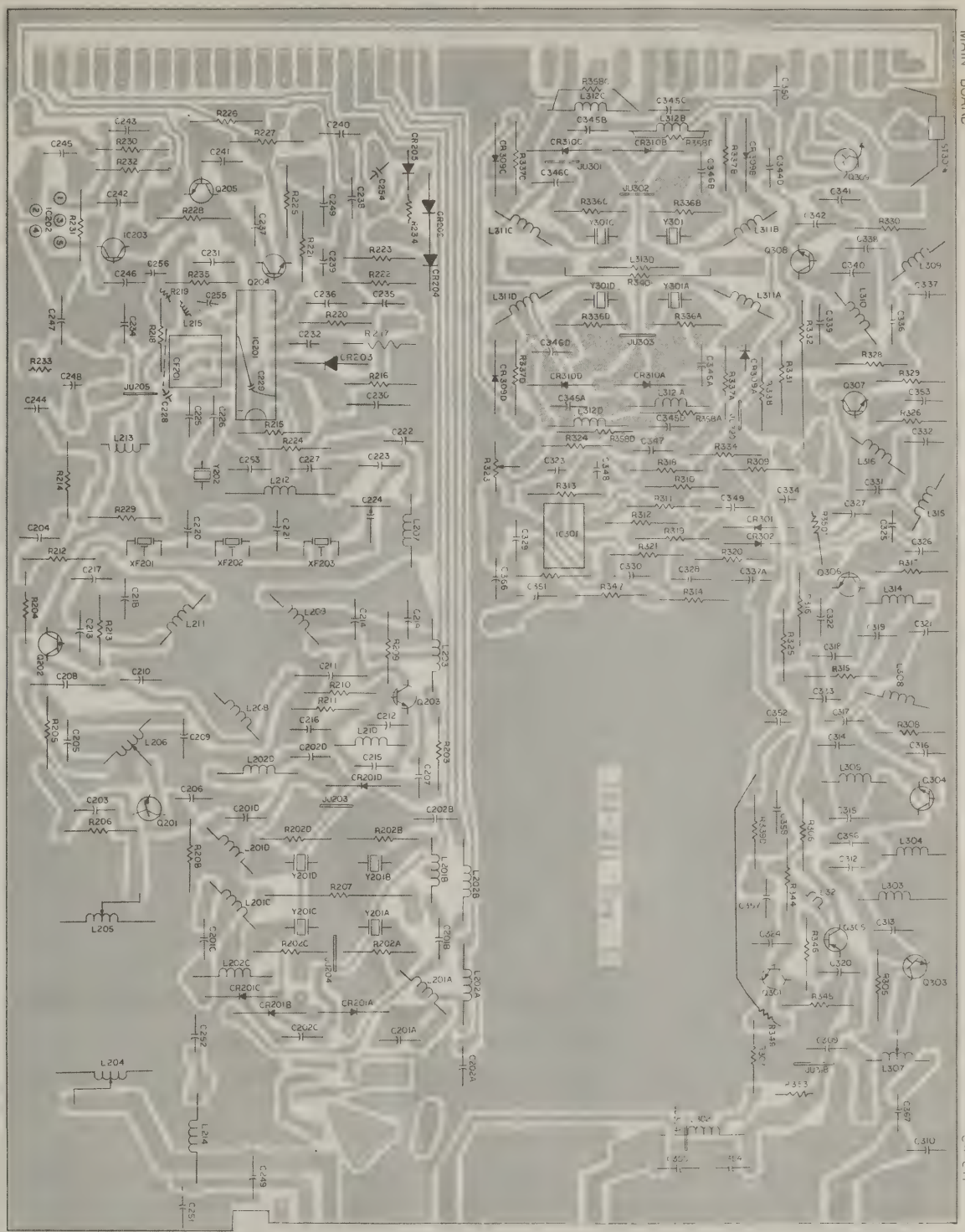
PARTS OVERLAY, P.A. BOARD

DRAWN	DATE	SIZE A	PART NUMBER TP14-116	REV. B
APPROVED	DATE			
DO NOT SCALE DWG.		SCALE		SHEET 14



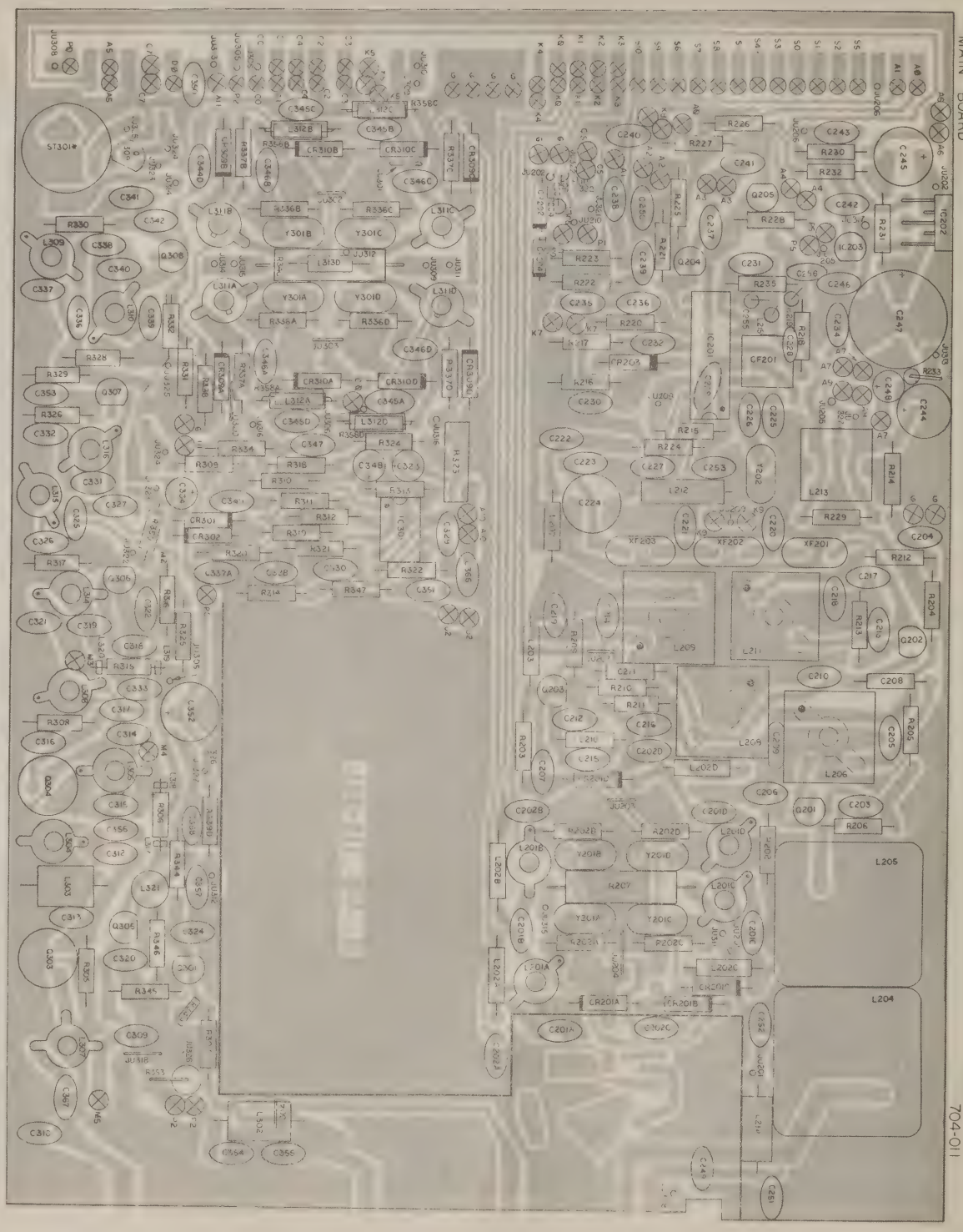
PARTS OVERLAY, CONTROL BOARD

DRAWN	DATE	SIZE A	PART NUMBER TP14-116	REV. B
APPROVED	DATE			
DO NOT SCALE DWG.		SCALE		SHEET 15



PARTS OVERLAY, MAIN BOARD

DRAWN	DATE	SIZE A	PART NUMBER TP14-116	REV. B
APPROVED	DATE			
DO NOT SCALE DWG.		SCALE		SHEET 16



1. * PARTS MAY BE ACTIVE OR PASSIVE CRYSTAL HEATER CIRCUITS AND WILL DEPEND ON MODEL

PARTS PLACEMENT, MAIN BOARD

DRAWN	DATE	SIZE	PART NUMBER	REV.
APPROVED	DATE	A	TP14-116	B
DO NOT SCALE DWG.		SCALE		SHEET 17

PARTS LIST PA BOARD

LOCATION	DESCRIPTION	PART NO.
RESISTORS (All resistors are 10% ¼W unless otherwise noted)		
R101	220 ohm	4701-0221-042
R102	220 ohm	4701-0221-042
R103	not used	
R104	3.09 ohm	4701-0399-044
CAPACITORS		
C101 (Range A)	18 pf DM15 500V	1504-0180-505
C101 (Range B)	15 pf 5% 500V DM15	1504-0150-505
C101 (Range C)	15 pf 5% 500V DM15	1504-0150-505
C102	not used	
C103 (Range A)	18 pf DM15 500V	1504-0180-505
C103 (Range B)	15 pf 5% 500V DM15	1504-0150-505
C103 (Range C)	15 pf 5% 500V DM15	1504-0150-505
C104	270 pf 5% 500V DM15	1504-0271-505
C105 (Range A)	36 pf DM15 500V	1504-0360-505
C105 (Range B)	33 pf 5% 500V DM15	1504-0330-505
C105 (Range C)	33 pf 5% 500V DM15	1504-0330-505
C106 (Range A)	22 pf DM15 500V	1504-0220-505
C106 (Range B)	18 pf 5% 500V DM15	1504-0180-505
C106 (Range C)	18 pf 5% 500V DM15	1504-0180-505
C107	not used	
C108 (Range A)	12 pf 5% 500V DM15	1504-0120-505
C108 (Range B)	10 pf 5% 500V DM15	1504-0100-505
C108 (Range C)	10 pf 5% 500V DM15	1504-0100-505
C109	10 mf 35V Type U	1513-0100-006
C110	not used	
C111 (Range A)	10-80 pf DC405 trimmer	1517-0000-040
C111 (Range B)	4-60 pf 404PC trimmer (mica)	1517-0000-002
C111 (Range C)	4-60 pf 404PC trimmer (mica)	1517-0000-002
C112	150 pf 20 50V 25F	1523-0151-002
C113 (Range A)	300 pf mica undwd 500V	1522-0301-001
C113 (Range B)	250 pf mica undwd 500V	1522-0251-001
C113 (Range C)	200 pf mica undwd 500V	1522-0201-001
C114	10 mf 35V Type U	1513-0100-006
C115	150 pf 20 50V 25F	1523-0251-002
C116	not used	
C117	10-80 405PC trim (mica)	1517-0000-040
C118 (Range A)	100 pf DM15 500V	1504-0101-505
C118 (Range B)	68 pf 5% 500V DM15	1504-0680-505
C118 (Range C)	56 pf 5% 500V DM15	1504-0560-505
C119	100 pf 5% 5-0V DM15	1504-0101-505
C120	1000 mf 16M Type U	1513-0102-002
C121 (Range A)	120 pf 5% 500V DM15	1504-0121-505
C121 (Range B)	75 pf 5% 500V DM15	1504-0750-505
C121 (Range C)	75 pf 5% 500V DM15	1504-0750-505
C122 (Range A)	56 pf 5% 500V DM15	1504-0560-505
C122 (Range B)	47 pf 5% 500V DM15	1504-0470-505
C122 (Range C)	47 pf 5% 500V DM15	1504-0470-505
C123	not used	
C124	.005 +8-2 50V YZ	1503-0502-005

LOCATION	DESCRIPTION	PART NO.	
COILS			
L101	coil ½t	1801-1299-400	
L102	coil 5t	1801-3272-803	
L103	coil 2½t	1801-3407-702	
L104	ferroxcube uh 200 1914B	2502-0000-002	
L105	ferroxcube uh 200 1914B	2502-0000-002	
L106	not used		
L107	coil 5t	1802-4373-803	
T101	coil transformer	1800-1314-300	
DIODES			
CR101	silicon rect IN4002	4806-0000-004	
CR102	silicon IN4148	4805-1241-200	
RELAY			
RL101	Relay Guardian 1335P	4500-3251-900	
TRANSISTORS			
Q101	RF Power	4804-3170-902	
Q102	RF Power	4804-3170-903	

PARTS LIST RECEIVER BOARD

RESISTORS (All resistors are 10% ¼W unless otherwise noted)

R201	not used		
R202	res comp (only) 4.7K ohm	4700-0472-042	
R203	470 ohm	4701-0471-042	44 only
R204	100 ohm	4701-0101-042	
R205	4.7K ohm	4702-0472-042	
R206	10K ohm	4701-0103-042	
R207	wire wound 100 ohm 2W 5%	4707-0101-031	
R208	1K ohm	4701-0102-042	
R209	10K ohm	4701-0103-042	
R210	39K	4701-0393-042	
R211	2.7K	4701-0272-042	
R212	680 ohm	4701-0681-042	
R213	1K ohm	4701-0102-042	
R214	33 ohm	4701-0330-042	
R215	47K	4701-0473-042	
R216	180K	4701-0184-042	
R217	100K ohm	4701-0104-042	
R218	1.8K	4701-0182-042	
R219	47K	4701-0473-042	
R220	560K	4701-0564-042	
R221	not used		
R222	27K	4701-0273-042	
R223	27K	4701-0273-042	

LOCATION	DESCRIPTION	PART NO.
R224	33 ohm	4701-0330-042
R225	8.2K	4701-0822-042
R226	470K	4701-0474-042
R227	470K	4701-0474-042
R228	47K	4701-0473-042
R229	47K	4701-0473-042
R230	47K	4701-0473-042
R231	270 ohm	4701-0271-042
R232	2.7 ohm	4701-0279-042
R233	680 ohm	4701-0681-042
R234	2.2K	4701-0222-042
R235	1K	4701-0102-042
INTEGRATED CIRCUIT		
IC201	IC FM	3130-5127-100
IC202	IC AUDIO	3130-5407-602
IC203	IC 8V REG	3130-0000-014
TRANSISTORS		
Q201	Red top	4801-0000-035
Q202	Junct fet 2N5668	4811-0000-030
Q203	2N5130	4801-0000-095
Q204	SPS 952	4801-0000-010
Q205	SPS 952	4801-0000-010
CRYSTAL FILTER		
XF201	cry filt	2705-3232-200
XF202	cry filt	2705-1306-600
XF203	cry filt	2705-3232-200
CERAMIC FILTER		
CF201	ceramic filter	2700-3209-500
CRYSTAL		
Y202	crystal	2301-3151-601

LOCATION	DESCRIPTION	PART NO.	
DIODES			
CR201	silicon IN4148	4805-1241-200	44 Only
CR202	silicon IN4148	4805-1241-200	
CR203	silicon IN4148	4805-1241-200	
CR204	silicon IN4148	4805-1241-200	
CR205	silicon IN4148	4805-1241-200	
COILS			
L201	coil rf far	1800-3247-203	
L202	choke rf 5.6 uhy	1802-0569-008	44 only
L203	choke rf 5.6 uhy	1802-0569-008	44 only
L204 (Range A)	coil helical	1800-5129-112	
L204 (Range B)	coil helical	1800-4129-110	
L204 (Range C)	coil helical	1800-4129-111	
L205 (Range A)	coil helical	1800-51290112	
L205 (Range B)	coil helical	1800-5129-110	
L205 (Range C)	coil helical	1800-5129-111	
L206	coil rf	1800-3406-903	
L207	choke RF 100 uhy Airco	1802-0101-008	
L208	coil rf input	1800-3406-902	
L209	coil rf	1800-3406-904	
L210 (Range A)	choke .47 uhy Airco	1802-0478-008	
L210 (Range B)	choke .27 uhy Airco	1802-0278-008	
L210 (Range C)	choke .27 uhy Airco	1802-0278-008	
L211	coil rf (wht)	1800-3191-401	
L212	choke rf 15 uhy	1802-0150-004	
L213	coil rf	1800-6055-801	
L214	choke 5.6 uhy Airco	1802-0569-008	
L215	choke rf 100 uhy Airco	1802-0101-008	
CAPACITORS			
C201 (Range A)	10 pf 50V 10%	1500-0100-605	
C201 (Range B)	8.2 pf 500V NPO	1500-0829-905	
C201 (Range C)	5.6 pf	1500-0569-905	
C202	.01 mf +8-2 50V	1503-0103-007	44 only
C203	15 pf 10% NPO 50V	1500-0150-650	
C204	.01 mf +8-2 50V	1503-0103-007	
C205 (Range A)	8.2 pf 10% NPO 500V	1500-0829-905	
C205 (Range B)	5.6pf 10% NPO 50V	1500-0569-905	
C205 (Range C)	3.9 pf 10% 500V	1500-0399-905	
C206	.001 mf +8-2 50V	1503-0102-003	
C207	360 pf 50V 5% LCQ17	1506-0361-550	
C208 (Range A)	MUD 1 pf 10%	1510-0010-900	
C208 (Range B)	MUD .68 pf 10%	1510-0688-900	
C208 (Range C)	MUD .68 pf	1518-0688-900	
C209	.001 mf +8-2 50V	1503-0102-003	
C210 (Range A)	15 pf CD NPO 50V	1500-0150-650	
C210 (Range B)	8.2 pf 10% 500V	1500-0829-905	
C210 (Range C)	6.8 pf 5% 60V	1500-0689-905	
C211	MUD .47 pf 10%	1510-0478-900	

LOCATION	DESCRIPTION	PART NO.
C212	33 pf 10% NPO 50V	1500-0330-650
C213	.01 mf +8-2 50V	1503-0103-007
C214 (Range A)	12 pf CD NPO 500V	1500-0120-605
C214 (Range B)	10 pf 10% NPO 5b0V	1500-0100-905
C214 (Range C)	8.2 pf 10% 50V	1500-0829-905
C215	68 pf 50V 5%	1524-0680-002
C216	.001 mf +8-2 50V	1503-0102-003
C217	390 pf 50V 5% LCQ17	1506-0391-550
C218	.01 mf +8-2 50V	1503-0103-007
C219	.01 mf +8-2 50V	1503-0103-007
C220	4.7 pf 10% NPO 50V	1500-0479-905
C221	4.7 pf 10% NPO 50V	1500-0479-905
C222	.01 mf +8-2 50V	1503-0103-007
C223	100 pf 5% 50V LCQ17	1506-0101-550
C224	2-18 pf trim	1517-0000-034
C225	150 pf 5% 50V LCQ17	1506-0151-550
C226	68 pf 50V 5%	1524-0680-002
C227	.001 mf +8-2 50V	1503-0102-003
C228	.1 mf +8-2 50V	1503-0104-010
C229	.1 mf +8-2 50V	1503-0104-010
C230	.47 mf 8-12 BC12	1502-0474-006
C231	10 pf 10% NPO 50V	1500-0100-605
C232	.01 mf 100V 10% (mylar)	1508-0103-610
C233	not used	
C234	.1 mf +8-2 50V	1503-0104-010
C235	100 pf 5% 50V LCQ17	1506-0101-550
C236	470 pf 10% 50V 25F	1501-0471-007
C237	150 pf CD 50V	1523-0141-002
C238	.001 mf +8-2 50V	1503-0102-003
C239	.0047 mf 100V 10%	1508-0472-610
C240	.01 mf +8-2 50V	1503-0103-007
C241	.0047 mf 100V 10%	1508-0472-610
C242	.05 mf +8-2 25V	1502-0503-004
C243	.005 mf +8-2 50V YZ	1503-0502-005
C244	220 mf 16V 85D III Type U	1513-0221-002
C245	220 mf 16V 85D III Type U	1513-0221-002
C246	.1 mf +8-2 50V	1503-0104-010
C247	1000 mf 16V Type U	1513-0102-002
C248	1 mf 16V 85D III Typw U	1513-0010-002
C249	15 pf 10% NPO 50V	1500-0150-650
C250	.068 mf (mylar)	1508-0687-610
C251	.01 mf +8-2 50V	1503-0103-007
C252	.01 mf +8-2 50V	1503-0103-007
C253	.01 mf +8-2 50V	1503-0103-007
C254	.05 mf +8-2 25V	1502-0503-004
C255	.001 mf +802 50V	1503-0102-003
C256	.1 mf +8-2 50V	1503-0104-010

PARTS LIST TRANSMITTER BOARD

LOCATION	DESCRIPTION	PART NO.
CAPACITORS		
C301	not used	
C302	not used	
C303	not used	
C304	not used	
C305	not used	
C306	not used	
C307	not used	
C308	not used	
C309	.001 mf 50V	1503-0102-003
C310	24 pf 5% DM15	1504-0240-505
C310 (Range A)	27 pf 5% DM15	1504-0270-505
C310 (Range C)	22 pf 5% DM15	1504-0220-505
C311	not used	
C312	12 pf 5% 500V	1500-0120-500
C312 (Range A)	15 pf 5% 50V	1500-0150-650
C312 (Range C)	10 pf 5% 50V	1500-0100-650
C313	57 pf 5% LCQ17 50V	1500-0470-605
C313 (Range A)	56 pf RD 50V	1524-0680-002
C313 (Range C)	39 pf CD 50V	1500-0390-650
C314	.005 mf 50V	1503-0502-005
C315	5.6 pf 10% NPO 50V	1500-0569-905
C315 (Range A)	6.8 pf CD 50V	1500-0689-905
C315 (Range C)	4.7 pf CD 50V	1500-0479-905
C316	100 pf LCQ17	1506-0101-550
C316 (Range A)	120 pf SM LCQ17	1506-0121-550
C316 (Range C)	82 pf SM LCQ17	1506-0320-550
C317	39 pf 5% 500V	1500-0390-550
C317 (Range A)	47 pf CD NPO 500V	1500-0470-605
C317 (Range C)	36 pf CD NPO 50V	1500-0360-650
C318	3.9 pf 10% 500V	1500-0339-905
C318 (Range A)	4.7 pf CD NPO 500V	1500-0479-905
C318 (Range C)	3.9 pf 10% 500V	1500-0339-905
C319	33 pf 10% 50V	1500-0330-605
C319 (Range A)	39 pf CD NPO 500V	1500-0390-605
C319 (Range C)	30 pf CD NPO 500V	1500-0300-605
C320	.005 mf 50V	1503-0502-005
C321	.005 mf 50V	1503-0502-005
C322	.005 mf 50V	1503-0502-005
C323	10 mf 16V Type U	1513-0100-002
C324	.005 mf 50V	1503-0502-005
C325	100 pf LCQ17	1506-0101-550
C325 (Range A)	150 pf SM LCQ17	1506-0151-550
C325 (Range C)	82 pf DM LCQ17	1506-0820-550
C326	270 pf LCQ17	1506-0271-550
C326 (Range A)	300 pf SM LCQ17	1506-0301-550
C326 (Range C)	220 pf SM LCQ17	1505-0221-550
C327	6.8 pf 10% 600V	1500-0689-905
C327 (Range A)	8.2 pf CD 10%	1500-0829-905
C327 (Range C)	6.8 pf CD 10%	1500-0689-905

LOCATION	DESCRIPTION	PART NO.	
C328	.0033 mf 100V 10%	1508-0332-610	
C329	75 pf LCQ17	1506-0750-550	
C330	.01 mf 50V	1503-0103-007	
C331	82 pf 5% NPO 50V	1524-0820-002	
C331 (Range A)	120 pf SM LCQ17	1506-0121-550	
C331 (Range C)	82 pf 5% NPO 50V	1506-0820-002	
C332	.01 mf 50V	1503-0103-007	
C333	.01 mf 50V	1503-0103-007	
C334	1 mf 16V Type U	1513-0010-002	
C335	not used		
C336	100 pf LCQ17	1501-0101-550	
C336 (Range A)	150 pf SM LCQ17	1506-0151-550	
C336 (Range C)	82 pf SM LXQ17	1506-0820-550	
C337	270 pf LCQ17	1506-0101-550	
C337 (Range A)	300 pf SM LCQ17	1506-0301-550	
C337 (Range C)	180 pf SM LCQ17	1506-0181-550	
C338	6.8 pf 10% 500V	1500-0689-905	
C338 (Range A)	8.2 pf 10% 500V	1500-0829-905	
C338 (Range C)	6.8 pf 10% 500V	1500-0689-905	
C339	.01 mf 50V	1503-0103-007	
C340	82 pf 5% NPO 50V	1524-0820-002	
C340 (Range A)	100 pf SM LCQ17	1506-0101-550	
C340 (Range C)	68 pf RD	1524-0680-002	
C341	100 pf 10% 50V	1525-0101-006	
C341 (Range A)	150 pf TC N750	1524-0151-004	
C341 (Range C)	100 pf TC N330	1525-0101-006	
C342	100 pf 10% 50V	1525-0101-006	
C342 (Range A)	150 pf TC N750	1525-0151-004	
C342 (Range C)	100 pf TC N330	1525-0151-006	
C343	not used		
C344 (Range A	200 pf 5% 50V N750	1525-0201-044	44 only
C344D(Range A)	56 pf 5% NPO 50V RD205	1524-0560-002	41 only
C344D(Range B)	33 pf NPO 5%	1500-0330-650	41 only
C344D(Range C)	30 pf NPO	1500-0300-650	41 only
C345	.01 mf +8-2 50V	1503-0103-007	44 only
C346 (Range A)	82 pf NPO 50V	1524-0820-002	
C346 (Range B)	68 pf NPO 50V	1524-0680-002	
C346 (Range C)	47 pf NPO 50V	1524-0470-002	
C347	.1 mf 50V	1503-0104-010	
C348	10 mf 16V Type U	1513-0100-002	
C349	.01 mf 50V	1503-0103-007	
C350	.01 mf 50V	1503-0103-007	
C351	.01 mf 50V	1503-0103-007	
C352	100 mf 10V Type U	1513-0101-002	
C353	.01 mf 50V	1503-0103-007	
C354	.001 mf 50V	1503-0102-003	
C355	.001 mf 50V	1503-0102-003	
C356	2.2 pf 10% 50V	1500-0229-205	
C356 (Range A)	2.7 pf 10% 50V	1500-0279-205	
C356 (Range C)	1.5 pf 10% 50V	1500-0159-205	
C357	.01 mf 50V	1503-0103-007	
C358	270 pf LCQ17	1506-0271-550	
C359	not used		
C360	not used		
C361	not used		
C362	not used		
C363	not used		
C364	not used		

LOCATION	DESCRIPTION	PART NO.	
C365	not used		
C366	.01 mf 50V	1503-0103-007	
C367	10 pf 5% DM15	1504-0100-505	
C367 (Range A)	12 pf 5% DM15	1504-0120-505	
C367 (Range C)	10 pf 5% DM15	1504-0100-505	
COILS			
L301	not used		
L302	ferroxcube	2502-0000-002	
L303	ferroxcube	2502-0000-002	
L304	coil rf	1800-3152-009	
L305	coil rf	1800-3152-017	
L306	not used		
L307	coil rf	1800-3152-018	
L308	coil rf input	1800-3152-002	
L309	coil	1800-3152-412	
L310	coil rf	1800-3152-412	
L311	coil rf var	1800-3247-202	
L312	choke rf 100 uhy	1802-0101-008	44 only
L313	choke rf 100 uhy	1802-0101-008	44 only
L314	coil rf input	1800-3152-002	
L315	coil rf	1800-3191-412	
L316	coil rf	1800-3191-412	
L317	bead choke (used w/R306)	2502-0000-001	
L318	bead choke (uses w/R306)	2502-0000-001	
L319	bead choke (used w/R315)	2502-0000-001	
L320	bead choke (used w/R315)	2502-0000-001	
L321	choke ferroxcube	2502-3254-101	
TRANSISTORS			
Q301	SPS 952	4802-0000-010	
Q302	not used		
Q303	696-8	4804-3169-608	
Q304	696-5	4804-3169-605	
Q305	MPS A55	4801-0000-001	
Q306	Blue top	4801-0000-003	
Q307	Blue top	4801-0000-003	
Q308	Blue Top	4801-0000-003	
Q309	Wt top SPS 1539	4801-0000-060	
DIODES			
CR301	silicon IN4148	4805-1241-200	44 only
CR302	silicon IN4148	4805-1241-200	
CR303	not used		
CR304	not used		
CR305	not used		
CR306	not used		
CR307	not used		
CR308	not used		
CR309	varactor SMV 1172	4809-0000-001	
CR310	silicon IN4148	4805-1241-200	44 only

LOCATION	DESCRIPTION	PART NO.	
RESISTORS	(all resistors are 10% ¼W unless otherwise noted)		
R301	not used		
R302	not used		
R303	not used		
R304	not used		
R305	33 ohm	4701-0330-042	
R306	10 ohm	4707-0101-031	
R307	film 3.9K	4701-0392-042	
R308	270 ohm	4701-0271-042	
R309	10K	4701-0103-042	
R310	film 100K	4701-0104-042	
R311	47K ohm	4701-0473-042	
R312	1 meg	4701-0105-042	
R313	film 22K	4701-0223-042	
R314	22K	4701-0680-042	
R315	68 ohm	4701-0223-042	
R316	68 ohm	4701-0680-042	
R317	film 470 ohm	4701-0471-042	
R318	100 ohm	4701-0101-042	
R319	4.7 K ohm	4701-0472-042	
R320	47K ohm	4701-0473-042	
R321	10K	4701-0103-042	
R322	470K	4701-0474-042	
R323	var 10K	4751-3407-101	
R324	10K	4701-0103-042	
R325	100 ohm	4701-0101-042	
R326	100 ohm	4701-0101-042	
R327	not used		
R328	1.8K	4701-0182-042	
R329	2.2K	4701-0222-042	
R330	220 ohm	4701-0221-042	
R331	5.6K	5701-0562-042	
R332	film 22K	4701-0223-042	
R333	not used		
R334	47K ohm	4701-0473-042	
R335	not used		
R336	res comp (only) 15K	4700-0153-042	
R337	47K ohm	4701-0473-042	41 only
R338	47K ohm	4701-0473-042	
R339 D	470 ohm	4701-0471-042	44 only
R340	wire wound 100 ohm 2W 5%	4707-0101-031	
R341	not used		
R342	not used		
R343	not used		
R344	560 ohm	4701-0561-042	
R345	10K	4701-0103-042	
R346	1K	4701-0102-042	
R347	12K ohm	4701-0123-042	
R348	not used		
R349	3.9K ohm	4701-0392-042	
R350	film 22K	4701-0223-042	
R351	not used		
R352	not used		

LOCATION	DESCRIPTION	PART NO.	
R353	1 ohm 1W 10%	4701-0109-045	
R354	not used		
R355	not used		
R356	not used		
R357	not used		
R358	film 15K	4701-0153-042	44 only

THERMOSTAT

ST301	thermostat	5301-3407-601	

PARTS LIST CONTROL BOARD

RESISTORS (All resistors are 10% ¼W unless otherwise noted)

R401	470 ohm comp	4700-0471-042	44 only
R402	var 7.5K sq control	4750-3406-402	
R403	var res 5k on/off/vol	4750-3406-401	
R404	470 ohm comp	4700-0471-042	
R405	not used		
R406	470 ohm comp	4700-0471-042	
R407	470 ohm comp	4700-0471-042	
R408	10K comp	4700-0103-042	44 only
R409	10K comp	4700-0103-042	44 only
R410	10K comp	4700-0103-042	44 only
R411	10K comp	4700-0103-042	44 only
R412	10K comp	4700-0103-042	44 only
R413	10K comp	4700-0103-042	44 only
R414	10K comp	4700-0103-042	44 only
R415	10K comp	4700-0103-042	44 only

CAPACITORS

C401	.01 mf +8-2 50V	1503-0103-007	44 only
C402	.01 mf +8-2 50V	1503-0103-007	

DIODES

CR401	Led Red	4810-0000-001	44 only
CR402	Led Red	4810-0000-001	44 only
CR403	Led Red	4810-0000-001	44 only
CR404	Led Red	4810-0000-001	44 only
CR405	Led Red	4810-0000-001	
CR406	Led Red	4810-0000-001	
CR407	Led Red	4810-0000-001	

LOCATION	DESCRIPTION	PART NO.	
SWITCHES			
SW401	Rotary	5111-5411-001	44 only
SW402	slide option	5113-5136-001	
SW303	switch off/on/vol	4750-3406-401	
SW404	slide option	5113-5136-001	